

# **Concealable Buckle Apparatus**

## **Field of Invention**

The present invention relates to a concealable buckle apparatus.

## **Background of Invention**

Referring to Figures 8 and 9, a conventional concealable buckle apparatus includes a supporting element 70, a buckle 75, a locking device 80 and a panel 85. The buckle 75 is pivotally mounted on the supporting element 70 between an extended position and a concealed position. The locking device 80 is movably mounted on the supporting element 70 between a locking position and a releasing position. In the locking position, the locking device 80 locks the buckle 75 in the concealed position. The panel 85 is mounted on the supporting element 70 and defining an opening 41 through which the buckle 75 extends in the extended position and a slot 43 through which the locking device 80 is accessible. The concealable buckle apparatus may include a torque spring 90 for biasing the buckle from the concealed position to the extended position. The concealable buckle apparatus however includes a complicated structure and involves complicated fabrication and results in a high cost.

The present invention is therefore intended to obviate or at least alleviate the problems encountered in prior art.

1    **Summary of Invention**

2    The primary objective of the present invention is to provide a structurally  
3    simple concealable buckle apparatus.

4

5    According to the present invention, a concealable buckle apparatus  
6    includes a panel, a locking element, a shaft and a buckle. The panel  
7    includes a recess and a margin formed about the recess. The recess  
8    includes a bottom and a wall projecting from the bottom and two slots  
9    extending from the bottom to the wall. The locking element includes a  
10   concave first portion, a convex second portion extending from the first  
11   portion, a concave third portion extending from the second portion and a  
12   fourth portion extending from the third portion. The fourth portion of  
13   the locking element is secured to the bottom of the recess. The shaft is  
14   put between the locking element and the bottom of the panel. The  
15   buckle includes two lateral portions inserted through the slots and secured  
16   to the shaft and a central portion formed between the lateral portions.  
17   The buckle is concealed in the recess when the shaft is retained in the first  
18   portion of the locking element. The buckle is completely extended from  
19   the recess when the shaft is retained in the third portion of the locking  
20   element.

21

22   Other objects, advantages, and novel features of the invention will  
23   become more apparent from the following detailed description when  
24   taken in conjunction with the attached drawings.

25

26   **Brief Description of Drawings**

1 The present invention will be described through detailed illustration of  
2 the preferred embodiment referring to the drawings.

3

4 Figure 1 is a perspective view of a vehicle on which several concealable  
5 buckle apparatuses are installed according to the preferred embodiment of  
6 the present invention.

7

8 Figure 2 is a perspective view of one of the concealable buckle  
9 apparatuses of Figure 1.

10

11 Figure 3 is an exploded view of the concealable buckle apparatus of  
12 Figure 2.

13

14 Figure 4 is a cross-sectional view of one of the concealable buckle  
15 apparatuses of Figure 1.

16

17 Figure 5 is a cross-sectional view of the concealable buckle apparatus of  
18 Figure 2 in a concealed position.

19

20 Figure 6 is similar to Figure 5 but shows the buckle in a position between  
21 a fully extended position and the concealed position.

22

23 Figure 7 is similar to Figure 6 but shows the buckle in a fully extended  
24 position.

25

26 Figure 8 is a conventional concealable buckle apparatus.

1 Figure 9 is a conventional concealable buckle apparatus.

2

3 **Detailed Description of Preferred Embodiment**

4 Referring to Figures 2 and 3, according to the preferred embodiment of  
5 the present invention, a concealable buckle apparatus 1 includes a casing  
6 10, a panel 20, a locking element 30, a buckle 40 and a shaft 50.

7

8 The casing 10 includes a recess 11 defined therein, a margin 12 formed  
9 about the recess 11 and two apertures 13 defined in the margin 12. The  
10 recess 11 is located between the apertures 13.

11

12 The buckle 40 includes a U-shaped configuration. That is, it includes  
13 two lateral portions 42 and a central portion 44 formed between the  
14 lateral portions 42 for supporting a rope or strap.

15

16 The panel 20 includes a recess 21 defined therein, a margin 22 formed  
17 about the recess 21 and two apertures 23 defined in the margin 22. The  
18 recess 21 is located between the apertures 23. The recess 21 includes a  
19 bottom 24 and four walls 25 extending from the bottom 24. Two slots  
20 28 extend from the bottom 24 to one of the walls 25 for receiving the  
21 lateral portions 42.

22

23 The shaft 50 defines two apertures 52 each for receiving one of the lateral  
24 portions 42.

25

26 The locking element 30 includes a first portion 32, a second portion 34

1 extending from the first portion 31, a third portion 36 extending from the  
2 second portion 34 and a fourth portion 38 extending from the third  
3 portion 36. The first portion 32 and the third portion 36 are concave  
4 while the second portion 34 is convex. The fourth portion 38 is flat and  
5 secured to the back of the panel 20.

6  
7 The shaft 50 is put between the panel 20 and the locking element 30.  
8 The lateral portions 42 of the buckle 40 are inserted through the slots 24  
9 of the panel 20 into the apertures 52 of the shaft 50. The lateral portions  
10 42 of the buckle 40 are secured to the shaft 50. Thus, the buckle 40 is  
11 retained on the panel 20.

12  
13 Referring to Figures 1 and 4, a vehicle 60 includes several openings 61  
14 each for receiving the recess 11 of the casing 10 of a concealable buckle  
15 apparatus 1. The panel 20 is put next to the casing 10 so that the locking  
16 element 30 is put between the panel 20 and the casing 10. A locking  
17 plate 62 is located against the vehicle 60 and the recess 11. Two bolts  
18 63 are driven into the locking plate 62 and the vehicle 60 through the  
19 apertures 23 and the apertures 13. Thus, the panel 20 is secured to the  
20 casing 10, and the whole concealable buckle apparatus 1 secured to the  
21 vehicle 60.

22  
23 Referring to Figure 1, more than one concealable buckle apparatus 1 can  
24 be installed on the vehicle 60 and can securely hook a rope for holding  
25 cargo on the vehicle 60.

1 Referring to Figure 5, the buckle 40 is concealed in the recess 21. The  
2 shaft 50 is put in the first portion 32 of the locking element 30. Thus,  
3 the buckle 40 is retained in the concealed position.

4 Referring to Figure 6, to use the buckle 40, the buckle 40 is pivoted from  
5 the recess 21. The shaft 50 is moved past the second portion 34 of the  
6 locking element 30.

7

8 Referring to Figure 7, the buckle 40 is pivoted to a completely extended  
9 position. The shaft 50 is put in the third portion 36 of the locking  
10 element 30. Thus, the buckle 40 is retained in the completely extended  
11 position. The rope or strap (not shown) is wound about the central  
12 portion 44 of the buckle 40.

13

14 The present invention has been described through detailed illustration of  
15 the preferred embodiment. Those skilled in the art can derive variation  
16 from the preferred embodiment without departing from the scope of the  
17 present invention. Therefore, the preferred embodiment shall not limit  
18 the scope of the present invention defined in the claims.

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